

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of

Use of Spectrum Bands Above 24 GHz For Mobile Radio Services

GN Docket No. 14-177

Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40.0 GHz Bands

IB Docket No. 15-256

Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band

RM-11664

Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations

IB Docket No. 97-95

**JOINT PETITION FOR RECONSIDERATION OF
EHOSTAR SATELLITE OPERATING CORPORATION,
HUGHES NETWORK SYSTEMS, LLC, AND INMARSAT, INC.**

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SUMMARY

EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC (collectively, “EchoStar”), and Inmarsat, Inc. (“Inmarsat,” and together with EchoStar, “Petitioners”) hereby petition for reconsideration of the *Order* issued in the above referenced proceedings adopting rules for the use of certain frequency bands above 24 GHz for mobile services by the newly-created Upper Microwave Flexible Use Service (“UMFUS”). This petition focuses on issues related to spectrum sharing between UMFUS and Fixed-Satellite Service (“FSS”) licensees in the 28 GHz band (27.5-28.35 GHz), which is used by FSS operators to provide an array of broadband, public safety, and other services to U.S. customers, and the 39 GHz band (38.6-40.0 GHz), which has long been targeted for expansion of such FSS operations to meet growing demand.

Petitioners agree with the Commission’s conclusion that the propagation and other characteristics of these bands offer inherent opportunities for spectrum sharing among services with different architectures and business plans, and appreciates the Commission’s commitment to working with interested stakeholders to resolve complex sharing issues. However, in its haste to adopt rules in this proceeding, the Commission did not conduct the necessary analysis of the costs and benefits of the regime imposed on FSS earth station deployment. As a result, although the Commission’s stated goal was to adopt rules that will allow both satellite and terrestrial networks to continue to expand in a flexible manner, some of the rules adopted in the *Order* would significantly undermine FSS efforts to deploy systems in these bands, if not discourage such deployment altogether.

Reconsideration affords the Commission an opportunity to conduct a proper cost/benefit analysis and refine its rules as necessary to achieve its goal of efficient spectrum sharing.

Accordingly, Petitioners request that the Commission:

1. ***Revise the conditions for deployment of FSS earth stations in new Section 25.136.*** As currently stated, these conditions would seriously impair the ability of FSS operators to make productive use of valuable spectrum resources. The record does not provide any meaningful justification for the decision to impose these conditions—much less demonstrate that the choices made reflect a thoughtful balancing of the relative costs and benefits of the limitations imposed, as required under the Administrative Procedure Act.

Accordingly, the Commission should:

- a. ***Eliminate its rule barring deployment of FSS earth stations near roads, railroads, event venues, and other specific locations.*** There is no analysis in the record to support this limitation. To the contrary, the report cited by the Commission demonstrates that the fiber connectivity needed by earth station facilities is highly correlated with major roadways and railways. In addition, even a cursory analysis shows that restricting FSS deployment near the 750,000 km of arterial streets and 52,660 km of passenger railroad track in the U.S. would preempt such deployment in much of the country. The fact that the Commission failed to define any of the key terms in this rule (*e.g.*, “arterial street” and “major event venue”) demonstrates the failure to fully consider this limitation, and can also be expected to lead to disputes when it is applied in the future.
- b. ***Replace the “0.1 percent of population” metric for FSS earth station deployment with the AT&T/EchoStar coordination regime.*** There is no showing in the record that UMFUS operators would suffer economically or lack incentive to deploy their networks if they were able to serve less than 99.9% of all people located in their license areas. Indeed, the Commission acknowledges that terrestrial mobile services in the bands above 24 GHz will be used to support increases in capacity for heavily populated areas, not to mimic existing coverage over broad areas. In addition, the analysis used to assess the impact on FSS deployment was flawed and did not accurately reflect the true impact of this limitation. By contrast, the coordination regime jointly proposed by AT&T and EchoStar would strike an appropriate balance by reserving such “urban core” areas for UMFUS deployment and allowing co-primary deployment in the remaining areas.

- c. ***Eliminate the rule limiting FSS operators to three earth stations in any given county (for 28 GHz) or Partial Economic Area (“PEA”) (for 39 GHz).*** This rule is unnecessary if the Commission adopts the coordination regime discussed above. Indeed, this rule would be counterproductive to the extent it would prevent FSS operators from locating multiple earth station facilities in areas with appropriate infrastructure but little or no impact on UMFUS.
2. ***Establish a mechanism to enable FSS operators to identify where UMFUS stations are operating.*** The Commission’s rules require FSS operators to coordinate with any UMFUS provider that has facilities “constructed and in operation” in an area targeted for earth station deployment. The Commission’s online licensing database will identify who holds the UMFUS license in each area, but not whether that licensee has begun operations, and if so, where those operations are located. Without that information, FSS operators lack a critical input in designing their systems so as to avoid affecting UMFUS services. The coordination process would be much more efficient for both FSS and UMFUS licensees if the Commission were to maintain a database with the locations in which UMFUS facilities are constructed and in operation.
3. ***Clarify the application of the rules in two circumstances.*** First, clarify that additional antennas may be placed at grandfathered 28 GHz earth station sites. Expansion of existing earth station facilities is most efficient for FSS operators, and should have little effect on UMFUS operators who must already incorporate the presence of those earth station sites into their network designs. Second, clarify that most UMFUS service rules do not apply to FSS operators that acquire a UMFUS license at auction or in the secondary market for the sole purpose of protecting their earth station operations. New Section 30.6(b) acknowledges that such earth stations will operate in accordance with the satellite regulations in Part 25, but does not clearly indicate which (if any) of the rules for UMFUS operations would apply. The Commission should clarify that only the service

area, license term, and partitioning/disaggregation aspects of the UMFUS rules apply in this situation.

The Commission should take this opportunity to examine more thoroughly the regime it has established for UMFUS/FSS spectrum sharing, and to make appropriate modifications to better optimize that regime to achieve the robust sharing the Commission envisions. The proposals above would help to realize that goal, and serve the public interest in facilitating the intensive and productive use of the valuable spectrum in the 28 GHz and 39 GHz bands.

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IB Docket No. 97-95

**JOINT PETITION FOR RECONSIDERATION OF
ECHOSTAR SATELLITE OPERATING CORPORATION,
HUGHES NETWORK SYSTEMS, LLC, AND INMARSAT, INC.**

Pursuant to Section 1.429 of the Commission's rules, EchoStar Satellite Operating Corporation and Hughes Network Systems, LLC (collectively, "EchoStar"), and Inmarsat, Inc. ("Inmarsat," and together with EchoStar, "Petitioners") hereby petition for reconsideration of the *Order* issued in the above referenced proceedings adopting rules for the use of certain frequency bands above 24 GHz for so-called Fifth Generation mobile services as part of the new Upper

Microwave Flexible Use Service (“UMFUS”).¹ This petition focuses on issues related to spectrum sharing between UMFUS and Fixed-Satellite Service (“FSS”) licensees in the 28 GHz band (27.5-28.35 GHz), which is used by FSS operators to provide an array of broadband, public safety, and other services to U.S. customers, and the 39 GHz band (38.6-40.0 GHz), which is targeted for expansion of such operations to meet growing demand.

Petitioners agree with the Commission’s conclusion that “these bands offer inherent opportunities stemming from the physical characteristics of the spectrum to facilitate robust shared access,” and appreciates the Commission’s commitment to working with interested stakeholders to resolve complex sharing issues.² The Commission believes that it has “adopt[ed] rules that will allow both satellite and terrestrial networks to continue to expand in a flexible manner.”³ Some of the rules hastily adopted in the *Order*, however, would significantly undermine FSS efforts to deploy systems in the 28 GHz and 39 GHz bands, if not discourage such deployment altogether.

Accordingly, Petitioners request that the Commission:

1. Revise new Section 25.136 by (a) eliminating the rule barring deployment of FSS earth stations near roads, railroads, event venues, and other specific locations; (b) replacing the “0.1 percent of population” metric with the coordination approach jointly proposed by AT&T and EchoStar; and (c) eliminating the rule limiting FSS operators to three earth stations in any given county (for 28 GHz) or Partial Economic Area (“PEA”) (for 39 GHz). In each case, there is no justification in the record for the limitation imposed, and no evidence that the benefit to UMFUS would offset the cost imposed upon FSS.
2. Establish a mechanism to enable FSS operators to identify where UMFUS stations are operating in order to determine where deployment would have the least impact and where coordination would be required.

¹ See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd. 8014 (2016) (“*Order*”).

² *Id.* ¶ 2.

³ *Id.* ¶ 18.

3. Clarify that FSS operators may deploy additional antennas at grandfathered 28 GHz earth station sites, and that most UMFUS service rules do not apply to FSS operators that acquire a UMFUS license at auction or in the secondary market for the sole purpose of protecting their earth station operations.

By reconsidering the *Order* and adopting the revisions proposed above, the Commission will rationalize the relationship between FSS and UMFUS licensees sharing the 28 GHz and 39 GHz bands, enabling them to make more productive use of these valuable spectrum resources.

BACKGROUND

A. THE 28 GHZ AND 39 GHZ BANDS ARE ESSENTIAL TO THE PROVISION OF SATELLITE BROADBAND SERVICES.

The Commission has long recognized the critical role that satellites play in the nation's communications landscape. "Satellite technology is used to provide communication services throughout the United States and the world and is particularly important for communication in remote areas that are unserved or underserved by terrestrial communication facilities. Satellites also provide connectivity for first responders in emergencies and natural disasters."⁴ Satellite systems also offer service to a variety of platforms, from airlines to ships to moving vehicles. In addition, FSS systems support other broadband operators, including terrestrial mobile systems, by providing backhaul and other services. Thus, FSS enables the efficient extension of broadband services even to those who never communicate directly with a satellite.

The U.S. has allocated FSS on a co-primary basis in the 28 GHz band for Earth-to-space transmissions.⁵ Prior to the adoption of the *Order*, however, FSS had been designated as secondary to LMDS—but *only to LMDS*.⁶ In reliance upon this regulatory scheme, for nearly

⁴ *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, 28 FCC Rcd. 12403, ¶ 2 (2013).

⁵ See U.S. Table of Frequency Allocations, 47 C.F.R. § 2.106.

⁶ See 47 C.F.R. § 25.202(a)(1) n.2 (stating that "FSS is secondary to LMDS in this band").

twenty years, FSS operators have deployed uplink earth stations operating on a secondary, non-interference basis to LMDS in the 28 GHz band. Despite this secondary status, satellite operators have been able to co-exist with terrestrial operations in order to make extensive use of this band to provide critical services such as consumer broadband—services that are unavailable to many Americans by any other means.⁷ Since the *Order* was adopted, eight applicants have proposed non-geostationary orbit (“NGSO”) satellite systems that would operate in Ku- and Ka-band spectrum, including the 28 GHz band.⁸

The United States has also allocated FSS on a co-primary basis in the 39 GHz band for space-to-Earth transmissions.⁹ Unlike the 28 GHz band, however, FSS operators were allowed to deploy gateway earth stations in the 39 GHz band only if they obtained at auction the 39 GHz license in the area where the earth station would be located, or if they entered into an agreement with the corresponding 39 GHz licensee.¹⁰ Moreover, they were required to satisfy the requirements for terrestrial operation in the band even if they wanted only to operate a licensed earth station.¹¹ This dual licensing regime appears to have deterred FSS development, as there

⁷ Comments of EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC, and Alta Wireless, Inc. at 7, 24 (Jan. 27, 2016) (“EchoStar Comments”); Comments of the Broadband Satellite Operators at 4 (Jan. 27, 2016) (“FSS Operators Comments”). Unless otherwise indicated, all comments cited herein were filed in GN Docket No. 14-177 *et al.*

⁸ See IBFS File Nos. SAT-LOI-20161115-00108 (Telesat), SAT-LOA-20161115-00109 (Boeing), SAT-LOI-20161115-00111 (Space Norway), SAT-LOI-20151115-00112 (LeoSat), SAT-LOA-20161115-00113 (Karousel), SAT-LOA-20161115-00118 (SpaceX), SAT-LOI-20161115-00120 (ViaSat), and SAT-LOA-20161115-00121 (Theia Holdings). In addition, the application of WorldVu Satellites Limited d/b/a OneWeb was already pending when the *Order* was issued. See IBFS File No. SAT-LOI-20160428-00004.

⁹ See U.S. Table of Frequency Allocations, 47 C.F.R. § 2.106.

¹⁰ See 47 C.F.R. § 25.202(a)(1) n.3.

¹¹ See *TRW Inc.*, 16 FCC Rcd. 5198, ¶ 12 (WTB 2001) (“All operations under a 39 GHz EA license, including future operations of any FSS earth stations, must comply with the Part 101 rules governing the operation of the 39 GHz band.”).

are no U.S. space stations or earth stations authorized in this band.¹² Nonetheless, satellite operators from other countries have continued to develop this band,¹³ and three applications are currently pending before the Commission for authority to operate NGSO satellite systems using this band.¹⁴

As the Commission has recognized, because satellite technology has a long development path, regulatory certainty is critical to investment in satellite systems.¹⁵ In particular, satellite operators need reliable access to spectrum in order to ensure that they will have sufficient capacity to meet growing consumer demands for their services. This demand, in turn, has led satellite operators to explore and invest in the development of higher frequency bands, including the 28 GHz and 39 GHz bands, for the provision of broadband connectivity. Because these bands are internationally harmonized for FSS use, they are essential for FSS deployment. Indeed, the satellite industry's ongoing interest in these bands is evidenced by the many applications pending for NGSO systems. To be clear, Petitioners are not arguing that the

¹² See EchoStar Comments at 25-26 (discussing history of 39 GHz development); Reply Comments of EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC, and Alta Wireless, Inc. at 12-13 (Feb. 26, 2016)(same) ("EchoStar Reply Comments").

¹³ For example, Alphasat, a satellite launched in July 2013 by the European Space Agency in partnership with Inmarsat, hosts a Q/V-band payload that is used to conduct communication and propagation experiments to assess the feasibility of these bands for future commercial applications. See European Space Agency, *Alphasat's Pioneering High-Frequency Hosted Payload Set for Experiments* (Jan. 21, 2014), available at http://www.esa.int/Our_Activities/Telecommunications_Integrated_Applications/Alphasat/Alphasat_s_pioneering_high-frequency_hosted_payload_set_for_experiments.

¹⁴ See IBFS File Nos. IBFS File No. SAT-LOA-20160622-00058 (Boeing), SAT-LOA-20161115-00117 (Audacy Corporation), and SAT-LOI-20161115-00120 (ViaSat).

¹⁵ See, e.g., *In the Matter of Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands*, 18 FCC Rcd. 25428, ¶ 54 (2003) ("We recognize that both Government and commercial systems must remain sufficiently sure of their access to orbital and spectrum resources if they are to proceed with research, development and production of their planned space-station systems."). See also Executive Office of the President, *National Space Policy of the United States of America*, at 9 (2010) (requiring the U.S. government to (1) "[s]eek to protect U.S. global access to, and operation in, the radiofrequency spectrum and related orbital assignments required to support the use of space by . . . U.S. commercial users;" and (2) "[s]eek to ensure the necessary national and international regulatory frameworks will remain in place over the lifetime of the system"), available at http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf.

Commission should reverse its decision to authorize UMFUS in the 28 GHz and 39 GHz bands. But given that much of the rest of the world is focusing on other bands¹⁶ while these bands provide the rare harmonized spectrum capable of supporting international FSS systems, the Commission should give greater weight to the importance of ensuring that FSS operators can make use of this band.

B. THE RULEMAKING PROCEEDING

Confident in the ability of FSS earth stations to share spectrum with the proposed UMFUS operations, satellite carriers looked at this proceeding as a way to achieve the regulatory certainty needed to support their existing services and secure a pathway for expansion.¹⁷ The Commission proposed what it called a “market based” approach for allowing FSS gateway earth stations to acquire co-primary status—namely, satellite operators *themselves* could obtain UMFUS licenses.¹⁸ “That right,” reasoned the Commission, “in effect allows them to achieve co-primary status and would provide the protection the FSS providers seek.”¹⁹ Unfortunately, this was precisely the approach that had failed in the 39 GHz band and faced statutory obstacles as well.²⁰

¹⁶ See, e.g., European Commission Radio Spectrum Policy Group, “Strategic Roadmap Towards 5G for Europe,” at 3 (Nov. 9, 2016) (recommending 24.25-27.5 GHz as a pioneer band for terrestrial mobile above 24 GHz), available at http://rspg-spectrum.eu/wp-content/uploads/2013/05/RPSG16-032-Opinion_5G.pdf.

¹⁷ See, e.g., Comments of EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC, and Alta Wireless, Inc. at 24 (Jan. 15, 2015); Joint Comments of SES Americom, Inc., Intelsat Corporation, O3b Networks USA LLC, and Inmarsat, Inc. at 4 (Jan. 15, 2015).

¹⁸ *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, 30 FCC Rcd. 11878, ¶ 131 (2015) (“Notice”).

¹⁹ *Id.* ¶ 132.

²⁰ See, e.g., EchoStar Comments at iii, 34-35; EchoStar Reply Comments at 13-14 (each discussing prohibition on the auction of international satellite spectrum in the Open-market Reorganization for the Betterment of International Telecommunication Act (“ORBIT Act”).

In the course of the proceeding, the Commission and interested parties began to focus on the fact that FSS and UMFUS operations might be able to share the spectrum due to their respective characteristics. Terrestrial wireless operators recognized that

the primary opportunity for mmW deployment is in areas with the greatest population density. This is due to the fact that mmW spectrum is unlikely to deliver extensive coverage in a market but instead will be best suited to providing capacity via small cells and backhaul, particularly in densely populated areas.²¹

As the Commission has similarly recognized, short transmission paths and high propagation losses can facilitate spectrum reuse by limiting interference between transmitters and receivers in adjacent areas.²² These same propagation characteristics meant that the area around an FSS earth station that would affect or be affected by UMFUS operations could be relatively small.

Accordingly, the Commission, the satellite industry, and the wireless industry began discussions in hopes of agreeing upon a different approach that would allow FSS earth stations to co-exist with UMFUS operations. As part of this exercise, the parties undertook technical analyses in an effort to determine the zone around each FSS gateway where its transmissions (in the 28 GHz band) could be expected to cause harmful interference to UMFUS operations, or where its reception (in the 39 GHz band) would need to be protected.²³ Building upon this work, EchoStar and AT&T submitted a joint proposal under which the Commission would identify “urban core” areas that would be reserved for UMFUS licensees, securing the most attractive

²¹ Letter from Scott K. Bergmann (CTIA) to Marlene H. Dortch, GN Docket No. 14-177, *et al.*, at 2 (filed May 20, 2016) (“CTIA May 20 Letter”).

²² *See Order*, ¶ 6.

²³ *See, e.g.*, Letter from the Joint Filers to Marlene H. Dortch, GN Docket No. 14-177, *et al.* (filed May 6, 2016) (“May 6 Joint Letter”); Letter from EchoStar, Inmarsat, Intelsat, O3b Limited, OneWeb, SES Americom, Inc., and ViaSat Inc. to Marlene H. Dortch, GN Docket No. 14-177, *et al.* (filed May 12, 2016) (“Satellite Operators’ May 12 Letter”).

areas for terrestrial mobile deployment, while allowing FSS earth stations to be located elsewhere on a co-primary basis.²⁴

Late in the proceeding, Verizon submitted a letter containing a variety of proposals, including (1) dramatically increasing the “urban core” zones originally proposed by EchoStar and AT&T, (2) restricting each earth station’s interference zone to cover no more than 0.1 percent of *either* the population or the area of the census tract in which it is located, and (3) prohibiting FSS earth stations from affecting a variety of “properties that support transient populations,” to include universities, airports, stadia, national parks, *etc.*²⁵ As far as Petitioners are aware, the record reflects no serious effort to quantify the effect of any of Verizon’s proposed restrictions—individually or in the aggregate—on FSS earth station deployment. Nor, for that matter, did any party seek to quantify the need of UMFUS operators for any particular set of stringent protections. Rather, parties merely repeated that UMFUS operators should be given *some* protection from FSS gateway earth stations—an inarguable proposition, to be sure, but hardly sufficient to justify specific rules.

Despite this lack of quantification, the Commission proceeded to adopt a combination of limitations similar to those proposed by Verizon. Under these new rules, codified in new Section 25.136, in order to obtain an earth station license for operations in the 28 GHz or 39 GHz band, FSS operators must comply with *each* of the following restrictions:

1. Satellite carriers may in the aggregate deploy earth stations in no more than three locations in a county (28 GHz) or PEA (39 GHz).

²⁴ Letter from Jennifer Manner and Stacey Black to Marlene Dortch, GN Docket No. 14-177, *et al.* (Apr. 6, 2016) (“AT&T-EchoStar Apr. 6 Letter”); Letter from Jennifer Manner and Stacey Black to Marlene Dortch, GN Docket No. 14-177, *et al.* (May 19, 2016).

²⁵ Letter from Verizon to Marlene H. Dortch, GN Docket No. 14-177 *et al.* (June 14, 2016) (“Verizon June 14 Letter”).

2. The permitted interference zone²⁶ (28 GHz) or protection zone (39 GHz) around an FSS earth station, *along with similar zones for any other FSS earth stations in the UMFUS licensed area*, may not cover more than 0.1 percent of the population of the license area where the earth station is located.
3. FSS interference or protection zones may not contain any major event venue, arterial street, interstate or U.S. highway, urban mass transit route, passenger railroad, or cruise ship port.
4. If a UMFUS operator has facilities “constructed and in operation” within the interference or protection zone of a proposed earth station site, the FSS operator must successfully complete coordination.

As an alternative in both bands, the Commission also adopted its original “market based” proposal. Thus, FSS operators can place earth stations in locations where they themselves have obtained the UMFUS license covering the relevant interference or protection zone.²⁷

DISCUSSION

A. THE COMMISSION’S SHARING RULES LARGELY PRECLUDE FSS EARTH STATIONS FROM REASONABLE ACCESS TO FIBER AND OTHER VITAL INFRASTRUCTURE.

During the course of this proceeding, EchoStar and AT&T proposed excluding FSS earth stations from certain “urban core” areas—which were carefully defined and related to cities at least as large as Tucson.²⁸ They did so because they both recognized that UMFUS operators will principally target such densely-populated areas—an understanding shared by other wireless carriers and the Commission.²⁹ The two parties also recognized—as, ultimately, did the Commission—that satellite and UMFUS operations can coexist outside of such areas because

²⁶ For this purpose, the “permitted interference zone” of an earth station is defined as the “area in which the earth station generates a power flux density (PFD), at 10 meters above ground level, of no more than -77.6 dBm/m²/MHz.” See new 47 C.F.R. § 25.136 (a)(4)(ii).

²⁷ Order ¶ 55; new 47 C.F.R. § 25.136(a)(1).

²⁸ AT&T-EchoStar Apr. 6 Letter at Ex. 2, Addendum.

²⁹ See, e.g., CTIA May 20 Letter, *supra*; Order ¶ 35.

FSS earth stations require relatively small protection zones that “will have little impact on terrestrial use.”³⁰

EchoStar and AT&T also, however, took pains to define “urban core” in a way that would not unreasonably and unnecessarily preclude satellite earth station deployment. This was deliberate. While FSS earth stations need not be located in the most heavily populated areas, they *do* need to be located in areas with substantial Internet connectivity.³¹ As the Commission recognized, “[f]or satellite gateway earth stations in particular, the *sine qua non* is not proximity to population centers *per se*, but access to long-haul, high data-rate Internet facilities.”³² Likewise, they must be located in areas with ready sources of electricity, adequate roads to permit maintenance access, neighborhoods with appropriate commercial zoning, sufficient space for installation and expansion of large satellite antennas with an unobstructed view of the sky, and sufficient cooling capacity for large amounts of computing equipment.

The Commission chose not to implement the regime proposed by AT&T and EchoStar. Instead, it adopted rules that, taken in combination, will preclude deployment of FSS earth stations in areas with such characteristics. Indeed, we are unable to say with certainty that *any* of EchoStar’s existing FSS earth stations would be permitted under the Commission’s rules, either due to proximity to a highway or a populated residential area. Yet the record does not include a meaningful analysis of the costs and benefits of the rules adopted—a hallmark of reasoned

³⁰ Order ¶ 47.

³¹ See Letter from EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC, Inmarsat, Inc., Lockheed Martin Corporation, O3b Limited, SES Americom, Inc., ViaSat, Inc., and WorldVu Satellites Ltd./OneWeb to Marlene H. Dortch, GN Docket 14-177, *et al.* (June 10, 2016) (“Satellite Operators June 10 Ex Parte”) (describing varying need for Internet connectivity).

³² Order ¶ 92.

decisionmaking required under the Administrative Procedure Act.³³ Without changes, the Commission’s rules for FSS/UMFUS spectrum sharing will not achieve the Commission’s stated goal of “allow[ing] both satellite and terrestrial services to expand and coexist.”³⁴ Accordingly, Petitioners propose that the Commission reconsider its rules and make the specific changes discussed below.

B. THE COMMISSION SHOULD REVISE ITS CONDITIONS FOR FSS EARTH STATION DEPLOYMENT IN THE 28 GHZ AND 39 GHZ BANDS

New Section 25.136 establishes conditions for FSS earth station deployment in the 28 GHz and 39 GHz bands. Unfortunately, in its haste to adopt this rule, the Commission did not adequately analyze the rule’s impact. As a result, the limitations adopted would seriously and unnecessarily impair the ability of FSS operators to deploy earth stations. Those limitations should be reconsidered and revised as follows.

1. The Commission Should Eliminate its “Transient Population” Limitation

The failure to weigh the relative costs and benefits of a proposed rule is amply demonstrated by the “transient population” limitation, which prohibits FSS deployment that might infringe upon any major event venue, arterial street, interstate or U.S. highway, urban mass transit route, passenger railroad, or cruise ship port. This limitation arose from a suggestion made by Verizon just one month before the *Order* was adopted. However, in the haste to impose this limitation, neither the Commission nor any party supporting it made any attempt to quantify the effect of excluding FSS earth stations adjacent to such facilities and venues. For example, there is no evidence in the record or in the *Order* to even estimate how

³³ See, e.g., *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 513 (2009) (describing longstanding rule that an agency “examine the relevant data and articulate a satisfactory explanation for its action”), citing *Motor Vehicle Mfrs. Assn. of United States, Inc. v. State Farm Mut. Automobile Ins. Co.*, 463 U.S. 29, 43 (1983).

³⁴ *Order* ¶ 47.

much territory might be excluded under this limitation, much less whether such areas might be especially important to FSS operations because of access to fiber, power, *etc.* Nor, other than stating flatly it “could expect to have high demand for wireless services”³⁵ in such areas, did the Commission even attempt to show why this rule is necessary to promote UMFUS deployment.

Even a cursory investigation of the issue shows the potential magnitude of the problem this limitation would pose for FSS operators’ gateway deployment. The Commission recognizes that satellite gateway earth stations would need ready access to long-haul, high data-rate Internet facilities.³⁶ In support of the proposition that such facilities are available outside densely populated areas, the Commission cited a study of long-haul Internet routes across the United States, and included the map below as Figure 1 of the *Order*.³⁷



Yet the Commission ignored the actual conclusion of the report’s analysis.

These plots show that a significant fraction of all the physical links are co-located with roadway infrastructure. The plots also show that it is more common for fiber

³⁵ *Id.* ¶ 54.

³⁶ *Id.* ¶ 92.

³⁷ *Id.* ¶ 92 (citing R. Durairajan, P. Barford, J. Sommers and W. Willinger, *InterTubes: A Study of the US Long-haul Fiber-optic Infrastructure*, in Proceedings of ACM SIGCOMM (2015), available at <http://www.sigcomm.org/node/3852> (“InterTubes Report”)).

conduits to run alongside roadways than railways, and an even higher percentage are co-located with some combination of roadways and railway infrastructure.³⁸

Indeed, the report also includes a graph summarizing the fraction of long-haul fiber optic links co-located with highway and railway infrastructure which approaches 1:1—*i.e.*, an extremely high level of correlation.³⁹ By failing to recognize the full significance of its own evidence cited in the *Order*, the Commission failed to engage in the requisite analysis of the rule under consideration.

The potential for this limitation to stifle FSS gateway deployment can also be illustrated by a fairly simple analysis of the extent of roadway and railway deployment in the U.S. According to the U.S. Department of Transportation’s Bureau of Transportation Statistics, in 2014 (the most recent year for which data is available), the total length of arterial streets in the United States was approximately 750,000 km,⁴⁰ while the total length of passenger railroad track was approximately 52,660 km.⁴¹ Assuming (as the Commission does) that the protection zone around a 39 GHz gateway earth station would extend approximately 2 km,⁴² FSS gateways could not be deployed within the 4 km (*i.e.*, 2 km on each side) surrounding these routes. Applying this affected area to the length of arterial roads and passenger railroad lines yields approximately

³⁸ InterTubes Report at 570.

³⁹ *Id.*

⁴⁰ Bureau of Transportation Statistics, National Transportation Statistics, Table 1-5: U.S. Public Road and Street Mileage by Functional System (aggregate of “Principal arterials, Interstates,” “Principal arterials, Freeways and Expressways,” “Principal arterials, other,” and “Minor arterials” miles for both urban and rural) (*available at* http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_01_05.html).

⁴¹ *See id.*, Table 1-1: System Mileage Within the United States (aggregate of Amtrak and Transit miles) (*available at* http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_01_01.html).

⁴² *See Order* ¶ 90.

3,000,000 km² and 210,640 km², respectively—or a total area (3,210,640 km²) that is 35 percent of the land area of the United States (9,150,000 km²).⁴³

Compounding this error, the Commission also failed to define the terms of its new rule as necessary to specify the scope of its application. What is a “major” event venue, for example? Nationals Park presumably qualifies as “major,” but does Prince George’s Stadium (home of the Bowie Baysox), Harry Grove Stadium (home of the Frederick Keys), or Pfitzner Stadium (home of the Potomac Nationals) so qualify? (If so, why?) Does the term “arterial street” refer to the classifications used by the Federal Highway Administration⁴⁴ and apply to all arterials or just principal ones? (If so, why?) Are bus routes included in “urban mass transit routes”? (If so, why?) Is the term “cruise ship” in “cruise ship port” to be defined as it is under Homeland Security regulations⁴⁵—and, if so, is there a standardized list of ports served by such ships? The Commission fails to consider, much less provide answers to, such questions. Without resolving

⁴³ See Central Intelligence Agency, “The World Fact Book: Geography—United States” (*available at* <https://www.cia.gov/library/publications/the-world-factbook/geos/us.html>). In actual practice, the encumbered area would be somewhat smaller, given the overlap of zones covered by roads and rails in proximity to one another. A more sophisticated analysis would need to be done to more precisely determine the true extent of the areas in which FSS gateways could not be deployed. But the point is that the impact for just these two components of the rule is certain to be significant. By failing to undertake even such a rudimentary inquiry, the Commission had no basis upon which to perform a meaningful cost-benefit analysis before imposing this limitation.

⁴⁴ See, e.g., U.S. Dept. of Transportation, Federal Highway Administration, “Highway Functional Classification Concepts, Criteria and Procedures” (Dec. 2, 2013). Even this guide concedes that classification determinations are not always straightforward. See *id.*, Section 3.4 (“In many instances, assigning a functional classification to a roadway is straightforward, especially for Interstates and Locals. However, there is flexibility when deciding between adjacent classifications. For example, deciding whether a given roadway acts as a Minor Arterial or Major Collector can be subject to debate.”).

⁴⁵ See 33 C.F.R. §101.105 (“Cruise ship means any vessel over 100 gross register tons, carrying more than 12 passengers for hire which makes voyages lasting more than 24 hours, of which any part is on the high seas. Passengers from cruise ships are embarked or disembarked in the U.S. or its territories. Cruise ships do not include ferries that hold Coast Guard Certificates of Inspection endorsed for ‘Lakes, Bays, and Sounds’, that transit international waters for only short periods of time on frequent schedules.”).

these basic definitional issues, there is no way to determine the extent of the proposed rule or its impact on FSS operators—again, demonstrating a failure to engage in reasoned decisionmaking.

Under any formulation of the rule, the result will surely be materially hindered FSS deployment. For example, Hughes Network Systems has located one of its East Coast uplink centers at a campus in Germantown, Maryland situated between two major roadways (I-270 and Middlebrooks Road)⁴⁶ precisely because this location has sufficient connectivity, power, and other attributes necessary to support such a facility. The “transient population” limitation would have precluded development of this facility, and could prevent EchoStar from co-locating additional earth stations at this location as well.

2. The Commission Should Replace Its Population Impact Limitation With the Coordination Regime Proposed by AT&T and EchoStar

The Commission also failed to adequately examine the costs and benefits of its population impact limitation, which prohibits *aggregate* impact from *all* earth stations located in a license area from affecting more than 0.1 percent of the population of that license area.⁴⁷ For example, neither the Commission nor any party even attempted to establish that UMFUS operators would need access to 99.9% of the population in every license area, as opposed to 99.5% or 95% or even 90%. The *entirety* of Verizon’s justification for proposing the 0.1 percent figure was that “[t]hese density criteria will help ensure that within any particular market,

⁴⁶ Montgomery County, Maryland identifies I-270 as a “Freeway” and the relevant portion of Middlebrooks Road as a “Major Highway.” See Functional Classification Listing of the Master Plan of Highways, *available at* http://www.montgomeryplanning.org/transportation/highways/documents/FunctionalClassificationListingoftheMasterPlanofHighways_03022011.pdf. Presumably, either of those would qualify as an “arterial street.”

⁴⁷ The Commission noted that the International Bureau “will issue a public notice seeking comment on the appropriate methodology to calculate the 0.1 percent population limit and further details regarding earth station interference zone calculation (including propagation models, *e.g.* free space versus probabilistic), and will also seek comment on best practices for earth station siting to minimize the impact on UMFU services, colocation of earth stations, and accommodating multiple earth station interference zones without exceeding 0.1 percent of population in a given county.” *Order* ¶ 54 n. 120. This relates to application of the rule rather than the elements of it.

satellite users may construct earth stations only in its relatively less-densely populated areas.”⁴⁸ Such generalizations provide no basis for the balancing needed to engage in reasoned decisionmaking. The Commission did opine that allowing earth station deployment to affect 16 percent of a county “could seriously impair the growth prospects for mmW mobile,”⁴⁹ but it did not consider any smaller percentage. Nor did it consider evidence such as the most recent report by OpenSignal, which found that “overall U.S. 4G subscribers can now see an LTE signal 81% of the time,” a level that only seven other countries have achieved.⁵⁰ Accordingly, there is no basis in the record to conclude that UMFUS operators must be assured access to 99.9% of the population.

Nor did the Commission or any other party make any serious attempt to determine the extent to which FSS operations would be limited by having to avoid 99.9% of all population in every license area—or 99.97% if three earth stations are to coexist in the county.⁵¹ The Commission’s sole justification for picking this 0.1 percent figure for 28 GHz deployment appears to be the following: if one were to assume an even population distribution throughout every county in the United States, a particular satellite carrier’s interference zone would cover no

⁴⁸ Verizon June 14 Letter at 2.

⁴⁹ *Order* ¶ 91.

⁵⁰ See OpenSignal, “State of Mobile Networks: USA (February 2016),” available at <https://opensignal.com/reports/2016/02/usa/state-of-the-mobile-network/>.

⁵¹ EchoStar noted the lack of evidence in the record on this point a week before the Commission adopted the *Order*. See Letter from Jennifer A. Manner to Marlene H. Dortch, GN Docket No. 14-177 et al., at 1 (July 7, 2016) (“because of the paucity of information in the record on a population impact benchmark, the FCC should seek additional comment on the appropriate parameters for that benchmark”).

more than 0.1 percent of the population of any county that covers more than 80 km²—and the Commission asserts that there are only four counties in the United States smaller than that.⁵²

At the outset, it is worth noting that the Commission substantially undercounted the number of counties that cover less than 80 km². Indeed, the source cited by the Commission indicates that there are 29 such counties in Virginia alone, including several close to Washington, DC (Arlington County, Alexandria City, Fairfax City, and Falls Church City).⁵³ Moreover, the Commission’s calculation overestimates the average area in a county that could be available for FSS earth station deployment. For example, it fails to subtract those areas that the Commission has made unavailable because they are excluded under the “transient population” rule, discussed above. It also fails to recognize that the 0.1 percent limitation applies in the aggregate to as many as three FSS operators in a county —effectively tripling the size of the problematic counties using the Commission’s approach. And because grandfathered sites appear to count against the 0.1 percent cap, other FSS operators will be unable to deploy precisely in those areas that have been identified as most attractive to date.

Moreover, if one assumes (as the Commission did) that population is evenly distributed, the percentage population limit is marginally easier to meet in *more* densely populated areas (where more people can be affected without exceeding the limit). Perversely, therefore, the rule would create an incentive to locate new earth stations within, rather than well outside, the areas that are expected to be more attractive for terrestrial mobile systems. Such a result would undermine the objectives the Commission hoped to achieve in this proceeding.

⁵² Order ¶ 55.

⁵³ See *id.* n.126 (citing United States Census Bureau, *2010 Census Gazetteer Files*, available at <http://www.census.gov/geo/maps-data/data/gazetteer2010.html>). This data reports land area in square meters, which must be divided by 1,000,000 (*i.e.*, 1,000²) to convert to square kilometers.

Precisely because population is not evenly distributed, the effect of the limitation imposed on FSS operators is better assessed from a different perspective. As the Commission notes, the U.S. Census Bureau considers the “population-weighted density,” which can be thought of as the density at which the average person lives, to be a more accurate representation than raw population density.⁵⁴ “While the overall U.S. density stood at 87 people per square mile, population-weighted density shows that people actually lived at an average of 5,369 people per square mile,”⁵⁵ which converts to 2073 people per square kilometer. Assuming that an FSS earth station has an interference zone that extends in a circle with a radius of 160 meters, the affected area is 0.0804 km². Applying the average population-weighted density to that area results in coverage of approximately (2073)(0.0804)=167 people. An FSS earth station that affected 167 people would exceed 0.1 percent of the population in all but the largest 11.5% of counties nationwide.⁵⁶ Moreover, the limitation would actually be much more stringent in any area where up to three earth station operators sought to operate (and thus had to share the number of people affected). The Commission does not explain why an FSS earth station deployment that affects so few people in a county would have a material impact on the development of UMFUS services.

In summary, the 0.1 percent aggregate population impact metric has no support in the record, was justified by the Commission based on a faulty analysis, and does not reflect a

⁵⁴ See *Order*, Appendix B n.1 (“Population-weighted density is derived from the densities of all the census tracts including within the boundary of the CBSA [Core Based Statistical Area].” (quoting U.S. Census Bureau, “Patterns of Metropolitan and Micropolitan Population Change: 2000 to 2010,” at 23 (Sep. 2012) (“Population Patterns Data”), available at <http://www.census.gov/prod/cen2010/reports/c2010sr-01.pdf>).

⁵⁵ Population Patterns Data at 23.

⁵⁶ See U.S. Census Bureau, “Population, Housing Units, Area, and Density: 2010—United States—County; and for Puerto Rico,” available at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_GCTPH1.US06PR&prodType=table. For this purpose, we have excluded the 78 municipios located in Puerto Rico.

thorough balancing of costs imposed against benefits achieved. Accordingly, this limitation was not the product of reasoned decisionmaking required under the APA, and therefore must be reconsidered and replaced by a different approach.

By contrast, the regime proposed jointly by AT&T and EchoStar strikes an appropriate balance between safeguarding the “urban core” areas that are the prime targets for UMFUS deployment while preserving a greater degree of flexibility for FSS earth station deployment in the remainder of the country. The Commission appreciated the effort to forge such a compromise, yet declined to adopt that proposal “because it would have provided less predictability regarding the locations of future earth stations, and it would have limited the ability of FSS to deploy near population centers even if the deployment affected a small percentage (or even none) of the population.”⁵⁷ In urban core areas, the AT&T/EchoStar proposal would have provided *more* predictability by precluding earth station deployment. In the remaining areas, it would have enabled UMFUS operators to create their own predictability through the actual deployment of their systems. In addition, the proposal specifies that FSS earth stations could be deployed in urban core areas on a secondary basis. Thus, nothing would prevent an FSS operator from reaching a commercial arrangement with the UMFUS licensee in an urban core area where such an arrangement would be deemed mutually beneficial. If the Commission wanted to enhance opportunities for FSS gateway operations in those areas, it could even give FSS a safe harbor for deployment where the proposed gateway would not exceed the 0.1 percent population impact metric.

The regime proposed by AT&T and EchoStar would serve the public interest. There are any number of other approaches that could also ensure that FSS operators had sufficient

⁵⁷ Order ¶ 60.

flexibility to deploy their systems while also allowing UMFUS operators to thrive. But whatever approach the Commission decides to pursue, it must replace the 0.1 percent metric as ill-conceived and unjustified.

3. The Commission Should Eliminate its “Three-Earth-Stations-Per-License Area” Limitation

The Commission should also eliminate the rule limiting FSS earth station deployment to three per UMFUS license area.⁵⁸ To the extent the Commission imposes a limitation on the population in each license area that can be affected by FSS earth station operations (28 GHz) or must be protected (39 GHz), there is no reason to *also* impose an arbitrary numerical limit. Such a rule is redundant and unnecessary.⁵⁹ The rule is also unnecessary under the AT&T/EchoStar regime, in which certain areas are presumptively reserved for UMFUS only and FSS may deploy in the other areas only where not used by UMFUS. In addition, the Commission has not explained why three is the right number to associate with such a rule. The Commission simply notes that there are over 3,000 counties in the United States, so that “FSS licensees would have many choices for earth station locations.”⁶⁰ However, there are only 410 PEAs in the United States, placing a significantly greater limitation on 29 GHz deployment.⁶¹ Moreover, the Commission fails to explain why a limitation on the number of earth stations deployed per

⁵⁸ See new 47 C.F.R. §§ 25.136 (a)(4)(i) and (c)(1).

⁵⁹ Indeed, the limitation would appear to apply even to an FSS operator that holds the UMFUS license for the relevant area, a result that cannot be justified at all.

⁶⁰ *Order* ¶ 55.

⁶¹ See *id.* ¶ 91 n.217.

license area is necessary for either band in the first place, surely a prerequisite for reasoned decisionmaking.

In fact, the three-per-county rule provides exactly the *wrong* incentives for FSS-UMFUS sharing. If satellite carriers can find a location that does not interfere with UMFUS operations or affect any potential UMFUS customers, the Commission ought to encourage as many earth stations and operators as possible to deploy facilities there. While multiple co-located earth stations count as a single facility for purposes of this limit,⁶² FSS operators have explained the technical, practical, and commercial reasons why co-location of multiple FSS operators (as opposed to multiple antennas of a single operator) is not a viable option in most cases.⁶³ This limitation would prohibit more than three FSS operators from developing sites in precisely those areas the Commission and UMFUS operators would want them to be located, effectively undercutting the Commission's objectives in this proceeding.

C. THE COMMISSION SHOULD CREATE A DATABASE OF OPERATING UMFUS FACILITIES TO FACILITATE COORDINATION

The Commission requires an FSS operator to engage in coordination with any UMFUS provider that has facilities “constructed and in operation” in the license area where the FSS operator proposes to deploy a gateway earth station.⁶⁴ This gives FSS operators a powerful incentive to identify areas for earth station deployment that would not affect UMFUS services—which would also be preferred by UMFUS licensees. Presumably, the Commission's online databases will identify the UMFUS licensee in each area once licenses have been issued. Yet FSS operators—who will be seeking to deploy hundreds of earth stations across the country in

⁶² See new 47 C.F.R. §§ 25.136(a)(4)(i), 25.136(c)(1).

⁶³ See Satellite Operators June 10 Ex Parte at 2-4.

⁶⁴ See new 47 C.F.R. §§ 25.136 (a)(4)(iv), 25.136(c)(4).

the aggregate—would have no way of knowing from those records whether those licensees have actually constructed facilities or made them operational, and if so, where those facilities and operations are located. Thus, there would be no efficient way for an FSS operator to search for suitable areas for deployment that would avoid any impact on UMFUS services.

Instead, FSS operators would have to undertake a burdensome effort to ask hundreds of UMFUS licensees (and perhaps more, if licenses are disaggregated or partitioned) to evaluate proposed gateway earth station sites. Under the coordination procedures set forth in Section 101.103(d), which the Commission has made applicable to FSS-UMFUS negotiations,⁶⁵ an FSS operator must provide a very concrete proposal to a UMFUS licensee for operations at a particular location with a specified set of operating parameters.⁶⁶ The UMFUS operator is obligated to respond with respect to that proposal. It is not, however, obligated to identify any alternative areas in the licensed territory that might be suitable for FSS deployment due to the absence of operational facilities. Thus, FSS operators would have to engage in something akin to a very large-scale game of Battleship, calling out proposed coordinates until they finally find some that elicit the desired response. This would be highly inefficient for FSS, but would also impose burdens on UMFUS operators to respond to repeated notifications with respect to proposed gateway sites.

A better, simpler solution would be for the Commission to create a database of UMFUS operations upon which FSS operators can rely, along the lines of the “spectrum access system” proposed for use in the 47 GHz band.⁶⁷ This would enable FSS operators to assess potential gateway sites nationwide in order to avoid the need for coordination or at least limit the number

⁶⁵ *Order* ¶ 54.

⁶⁶ *See* 47 C.F.R. § 101.103(d)(2)(ii).

⁶⁷ *Order* ¶ 413.

of UMFUS operators that must be engaged in coordination discussions to confirm final parameters. This approach might ultimately reduce the burden of coordination on UMFUS operators, because FSS operators would be able to identify and target those areas in a county or PEA where no coordination is required—without involving the UMFUS operator. This would truly be a win-win for both FSS and UMFUS operators interested in sharing the 28 GHz and 39 GHz bands.

D. THE COMMISSION SHOULD CLARIFY THE APPLICATION OF ITS RULES IN TWO RESPECTS

1. Addition of Antennas at Grandfathered 28 GHz Earth Station Locations

The Commission should clarify the extent to which additional antennas may be placed at grandfathered 28 GHz earth station sites. As the Commission noted in grandfathering these sites, these earth stations are used to provide valuable services to customers.⁶⁸ Expansion of existing earth station facilities, where land and buildings are already under lease and other infrastructure has already been provisioned, is most efficient for FSS operators. Moreover, such expansion should have little effect on new UMFUS operators who, as the Commission observed, “will have the ability to take the existing FSS earth station into account before it acquires the license or plans deployment.”⁶⁹

2. Inapplicability of Most UMFUS Service Rules to FSS Operations

As an alternative to meeting the conditions for gateway deployment in Section 25.136, FSS operators may obtain primary status by acquiring at auction or in secondary markets the UMFUS license covering the areas to be used by their gateway earth stations.⁷⁰ As EchoStar

⁶⁸ *Id.* ¶ 59.

⁶⁹ *Id.*

⁷⁰ *Id.* ¶ 55; new 47 C.F.R. § 25.136 (a)(1).

pointed out, this approach is similar to the dual licensing regime that has stymied FSS development of the 39 GHz band, and also could violate the ORBIT Act.⁷¹ Nonetheless, given that the Commission has chosen to make this option available, it should at least ensure that it is viable as well.

New Section 30.6 states that, when providing FSS services, UMFUS licensees must operate in accordance with the satellite regulations in Part 25.⁷² This does not, however, clearly absolve such licensees of the other regulatory obligations in Part 30 that come with a UMFUS license. Accordingly, the Commission should clarify that most UMFUS service, operational, and technical rules—those that govern terrestrial UMFUS operations—do not apply to operations under UMFUS licenses held by satellite carriers for the purpose of protecting FSS operations.

More specifically, the Commission should clarify that FSS operators holding UMFUS licenses in order to protect their earth station operations are subject only to the following UMFUS service rules: (1) Section 30.5 (Service Areas); Section 30.104 (License Term); and (3) Section 30.106 (Geographic partitioning and spectrum disaggregation). These rules establish the core aspects of a UMFUS license, but do not relate to the provision of unwanted terrestrial services and do not infringe upon the rules in Part 25 that govern FSS earth station operations. Providing this clarification would at least ensure that one proven impediment to satellite deployment in the bands above 24 GHz would no longer be an issue.

CONCLUSION

Petitioners continue to believe that FSS operators can share the 28 GHz and 39 GHz bands with UMFUS operators, without unduly limiting the planned operations of either service.

⁷¹ See, e.g., EchoStar Comments at 25-26, 34-35.

⁷² See new 47 C.F.R. § 30.6(b).

Despite the Commission's intention to promote such sharing, some of the rules adopted in the *Order* will unnecessarily impede FSS deployment, and thus will not unleash the full potential of this valuable spectrum resource. The Commission should reconsider those rules and revise them as set forth above.

Respectfully submitted,

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December 14, 2016